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UNITED STATES DEPARTMENT OF AGRICULTURE

FOREST SERVICE

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January 15, 1925.

Insect Control (D-6)
Deschutes.

THE PROPOSED

METOLIUS PINE BEETLE CONTROL PROJECT

ON THE

DESCHUTES NATIONAL FOREST, OREGON.

By
A. J. Jaenicke,
Forest Examiner.

GOVERNMENT PRINTING OFFICE

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Introductory Statement

This report supplements the report of December 20, 1923 submitted to the Forester. It was recommended in that report that $7,900 be provided to carry on the control work in the spring of 1924 but the money was not available.

In November, 1924, the western pine beetle situation in the Metolius yellow pine was studied again with the help of Forest Supervisor H. L. Plumb and District Ranger Perry A. South. No marked changes were found to have occurred since November, 1923, except a tendency of the infestation to increase in severity and to spread beyond its present boundaries.

This report describes the infestation in greater detail than in the 1923 report and covers the situation as it was in November, 1924. The data are given in detail in order to meet the Bureau of Entomology's needs in its work on the project. Therefore, strictly entomological matters have been included as well as matters of an administrative character.

Statistical Summary

I. Acreage.

A. National Forest	25,000 acres
B. Private	500 acres

2. Yellow Pine Volumes (1925)

A. National Forest	240,000 M.bd.ft.
B. Private	500 M.bd.ft.

3. Beetle Losses in Yellow Pine (National Forest Area)

1916 - 1922 inclusive	16,500 M.bd.ft.
1923	3,500 M.bd.ft.
1924	4,000 M.bd.ft.
1916-1924 (nine years)	24,000 M.bd.ft.

4. Overwintering Infestation (January, 1925)

A. National Forest

900 board feet per tree
2300 trees
2100 M. board feet.

B. Private

900 board feet per tree
40 trees
36 M. board feet.

5. Cost of control (National Forest Area)

2,100 M. board feet infested.
Maximum of 85% infested can be found and treated.
1,800 M. board feet to be treated.
$4.50 per M. board feet - cost of treatment.
$8,100 - estimated cost of project.

Description of the Project Area

The proposed project includes approximately 25,500 acres of timber, mostly yellow pine, in the extreme northern part of the Deschutes National Forest. Only 500 acres of this total are in private ownership.

The National Forest timber is estimated at 240,000 M. board feet of yellow pine and the private timber includes not more than 500 M. board feet. It is known as the Metolius timber and was covered by intensive reconnaissance in 1913.

This body of timber is a portion of the Bend working circle estimated to contain over two billion board feet of yellow pine. It is doubtful whether any part of the Bend working circle contains timber of higher quality and greater accessibility than the Metolius timber included in the proposed protection plan. Under present market conditions, the Metolius yellow pine is worth from $4.00 to $6.00 per thousand board feet.

The project area is shaded in red on the map which follows this report. The area is drained by the Metolius River and its tributaries. The elevation varies from 2,750 feet at the north end to approximately 5,000 feet along the summit of Green Ridge on the east boundary. Low bench land extends through the center of the tract and it is here

that by far the greater portion of the yellow pine is located.

The area is characterized by a typical forest of yellow pine but in certain portions of it there are other species in mixture. Along the creek beds, a mixed forest of Western larch, Douglas fir and white fir is common. On the east boundary of the area, namely the west slope of Green Ridge, considerable incense cedar occurs in mixture with yellow pine. The west boundary of the area marks the end of the commercial yellow pine type and the beginning of either brush-covered slopes or a mixed forest of Douglas fir and white fir. Along most of the north boundary, either brush fields or mixed Douglas fir and white fir forests predominate. The south boundary of the project was drawn so as to exclude private timber and so as to include at the same time the main portion of the Metolius infestation.

Most of the yellow pine is five log and six logs in length. A 30 or 40 foot length of clear bole is common. At least three-fourths of the yellow pine is mature.

In addition to the timber values, high recreation values are involved in this project. Along the Metolius River, summer home sites have been laid out by the Forest Service and camp sites have been fenced and improved. A careful estimate shows that 16,000 people spent a day or more in the Metolius country during the 1924 season.

There is a steadily growing demand for summer home sites and camp grounds in the area included by the project. The killing of groups of trees in the recreation area and especially on the summer home sites, has been repeatedly brought to the attention of the Forest Service by the public as being a menace to the recreation value of the region.

The Beetle Losses.

The western pine beetle (Dendroctonus brevicomis) has been responsible for the death of at least 95% of the insect-killed trees in the area during the past 20 years, and it is the only insect of any importance in the present epidemic.

The beetle epidemic now in progress on the area probably had its beginnings in 1916 when, according to local forest officers, a normal infestation began to be replaced by an infestation which steadily increased for several years until in 1920 the beetle loss amounted to perhaps two per cent of the stand instead of the two-tenths of one per cent which was probably the maximum loss in 1916. The cause of this increase is unknown. No extensive cuttings, large fires or unusual windfalls occurred immediately before or during the period of this beetle increase. A decline in 1921 and 1922 was followed by increases in 1923 and 1924. The character and quantity of the overwintering infestation

at this writing (January, 1925) show that it is likely that the beetle population in the area is greater than it was a year ago.

The beetle loss during the period 1916-1922 inclusive amounted to at least 16,500 M. board feet. In 1923 the loss was 3,500 M. In 1924, the yellow pine loss was at least 4,000 M. These are rough estimates, for no intensive cruises were made. The yellow pine stand was estimated in 1913 to be approximately 240,500 M. board feet. This estimate was low enough to justify its use as a 1924 figure in spite of the heavy beetle losses. With this estimate as a basis, the 1924 beetle loss is about one and two-thirds per cent of the stand. The beetle loss for the nine-year period 1916-1924 inclusive is 24,000 M. board feet, or ten per cent of the stand.

Using a $4.00 stumpage value, the western pine beetle killed $16,000 worth of yellow pine in the area in 1924. It is impossible to predict what further losses, even those of 1925, can be reasonably expected in the absence of control operations.

The Overwintering Infestation (January, 1925)

If control operations are begun in the spring of 1925, they will be confined to the trees now infested (January, 1925). The last examination of the area was made in

November, 1924. At that time, it was found that there was an unusual lack of uniformity in the stage of development of the beetles in the infested trees. It is evident that in 1924 there was a partial third generation in portions of the area in addition to the usual two generations. As a consequence, in many of the infested trees, the attacking beetles had hardly made a good start on their egg galleries in the middle of November, while the broods in other trees were so far along that a few more weeks of warm weather late in the fall would probably have resulted in their emergence. The advanced condition of the broods in some of the trees seems to call for control work as early in the spring as is administratively desirable, while those trees in which the attack started late in the fall, will probably necessitate very careful marking on account of the delayed fading of the foliage.

In 1923, the outstanding characteristic of the infestation was its concentration in groups of from 5 to 15 trees. In most cases, trees could be found in these groups which had been killed in 1922 and even in 1921. The distribution of the trees infested now is quite different. It is estimated that one-half of the 1924 overwintering infestation is in trees adjoining these old groups, while

the other half is to be found in scattered single trees or small groups away from the 1922 and 1923 trees.

The overwintering infestation is not uniformly distributed in the project area. In 1924, the beetles spread to many portions of the area formerly fairly free of beetle loss. This spread makes control of the beetle more difficult now than it was in the spring of 1924 when there was greater concentration of the beetles. However, even now, probably over three-fourths of the overwintering infestation is confined to less than one-half of the project area.

In December, 1923, it was estimated that the overwintering infestation was as follows:

National Forest lands	1950 trees	1,755 M.bd.ft.
Private lands	35 trees	32 M. bd.ft.

In November, 1924, it was estimated that there was a somewhat greater amount of overwintering infestation than the year before as follows:

National Forest lands	2300 trees	2,100 M.Bd.Ft.
Private lands	40 trees	36 M.bd.ft.

In both 1923 and 1924 the average volume of the infested tree was slightly more than 900 board feet per tree.

There are some sections in which the overwintering infestation is 150 trees per section, and other sections in which it amounts to less than 50 trees per section. The average number of infested trees per section on the project area is 60 trees.

Most of the infestation is in fairly mature yellow pine, although whenever groups of trees are killed, bull pine and trees intermediate between bull pine and yellow pine are commonly killed.

Desirability and Cost of Control Work.

The conditions which make control work on the Metolius project highly desirable may be summarized as follows:

1. The high value of the timber to be protected. With present market conditions, the timber is worth from $4.00 to $5.00 per M.

2. The severity of the present beetle epidemic and the possibility of its indefinite continuance in the absence of control work. The 1924 beetle loss was one and two-thirds per cent of the stand.

3. The fairly isolated position of the project on three sides as regards outside infestations. The danger of re-infestation of the project area from the infestation south of the project is an indefinite matter.

4. The timber included in the project is practically all in government ownership.

5. The immediate sale of the Metolius timber even if it were desirable as a part of the plan for the management of the Bend working circle, would result in the undisturbed activity of the beetles in all of the timber for at least one year more, and in part of the timber for several years.

6. The project offers unusual research opportunities in insect control by the Bureau of Entomology because of its accessibility, easy topography and the existence of at least a partially isolated western pine beetle epidemic of high severity in a typical western yellow pine stand.

It is estimated that the overwintering infestation in the project area, the infestation against which control measures in the spring of 1925 would be directed, is as follows for the National Forest portion of the project:

2300 trees.
900 board feet per tree.
2100 M. board feet.

Past experience in control work has shown the impracticability of finding and treating more than 85% of the infestation. On this basis, 1,800 M. board feet would be treated. Because of the accessibility of most of the area and its proximity to labor and supplies, control work will probably not cost

more than $4.50 per M. board feet. The control work on the Fremont National Forest during the calendar year 1924 cost $4.23 per M. board feet.

It is estimated that 36 M. board feet will have to be treated on the 500 acres of private land in the project. No definite arrangement has been made for the necessary cooperation from the owners concerned. However, it is known that they are keenly interested in the project.

The administrative features of the control work will be handled by the Deschutes National Forest. Assistance from the Bureau of Entomology in very definitely outlining the boundaries of the project and in the current inspection of the entomological aspects of the control operations are, of course, indispensable.

What additional control work will be needed in the fall of 1925 or in the spring of 1926 on the Metolius area or initial work on adjoining areas, will have to be determined by cooperative field work by the Bureau of Entomology and the Forest Service during the summer of 1925.

Infestations Adjacent to Metolius Project

In addition to the 25,000 acres of National Forest land included in the Metolius project, there is an area of 35,000 acres of yellow pine directly south of the project and within the Deschutes National Forest in which the yellow

pine is infested in varying degrees of intensity. Of these 35,000 acres, at least 20,000 acres are in private ownership. Most of this private timber is in the hands of Louis W. Hill of St. Paul, Minnesota. Even if control work were desirable, the owners of this timber are not ready now to cooperate with the Forest Service in carrying out a plan of beetle protection.

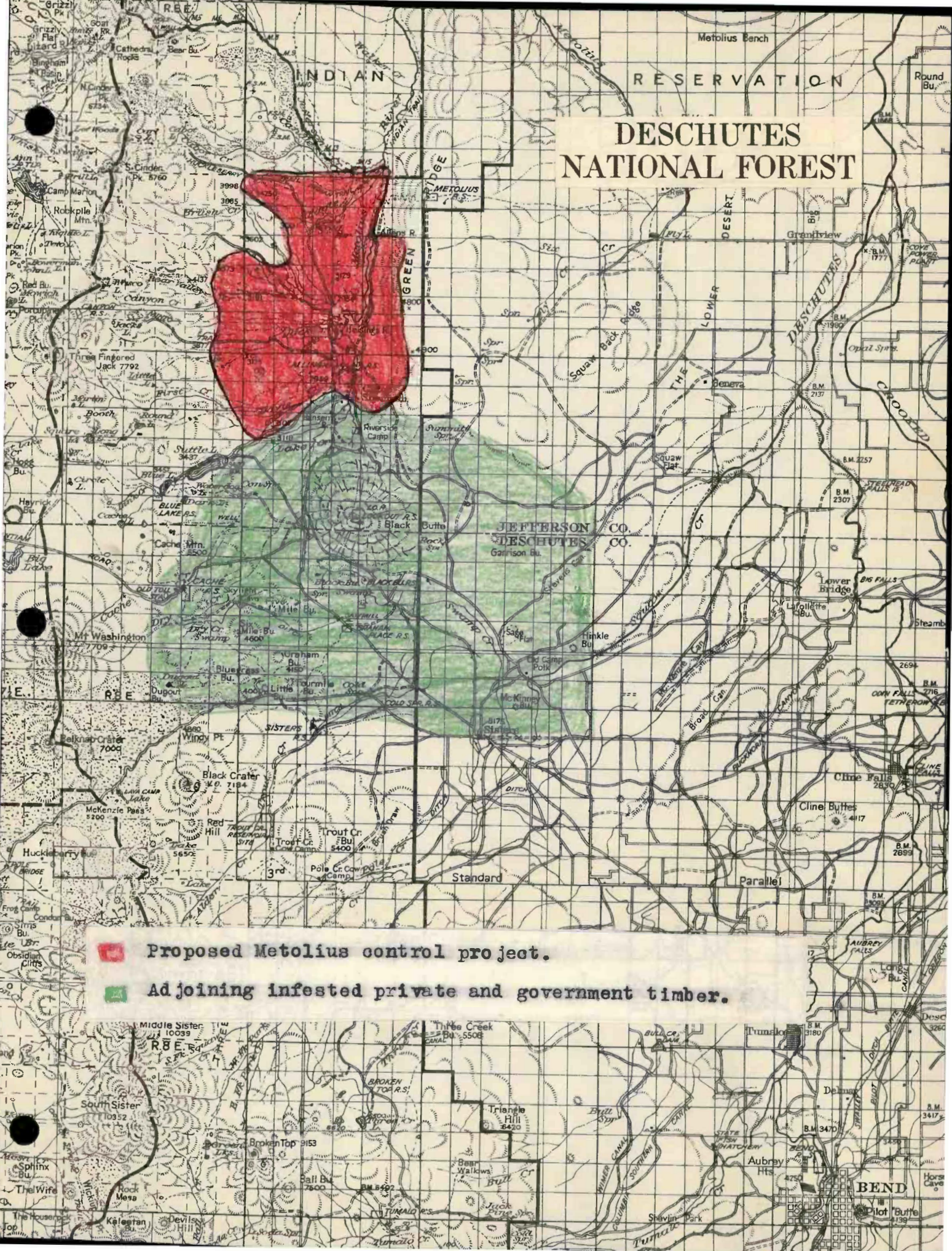
Directly east of this area of 35,000 acres but outside of the National Forest boundary, there is a body of privately owned timber of perhaps 25,000 acres, in which the western pine beetle is active to more than a normal degree. The owners of this timber have shown no intention of doing control work in the very near future.

A rough calculation of the 1924 beetle loss in these 60,000 acres outside of the Metolius project is one-half of one per cent of the stand, or about one-third of the intensity of the 1924 beetle losses on the Metolius project. Nevertheless, there are portions of these 60,000 acres in which the 1924 beetle losses are as severe as in the Metolius project. The exact extent and location of these spots of high loss are still undetermined.

In general, the quality of the timber included in these 60,000 acres is not as high as in the Metolius project. The owners are much concerned over the beetle losses, but the

possibility of control work and cooperation with the Forest Service and the Bureau of Entomology in such work, have not been suggested to them.

The general extent of these infested areas outside of the Metolius project is shown in green on the map which follows the last page of this report.


DESCHUTES
NATIONAL FOREST
INDIAN
RESERVATION
Metolius Bench
Proposed Metolius control project.
Adjoining infested private and government timber.